

Appl. No. 10/014,419
Amdt. dated January 7, 2004
Reply to Office action of October 7, 2003

Claim Amendments

Claim 1 (currently-amended): A method for determining the position of a moveable object within a given area, which comprises:

taking a sequence of frames of a given area with a video camera and calculating a current position of an object in the given area by electronically evaluating the frames of the sequence;

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comparing a currently taken one of the frames with a previously stored one of the frames to produce a differential image in which a contour of the object appears only when the object moves; and

calculating the position of the object based on the differential image; and

when the object is located within a predetermined region:

a1) calculating a current differential image;

b1) extracting a current contour of the object from the current differential image;

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c1) after initiation, defining a first contour and using the first contour as a template, and for all further contours, incorporating the current contour into the template in a weighted manner; and

d1) repetitively performing steps a1 through c1 in order.

Claim 2 (original): The method according to claim 1, wherein the object is a head of a front seat passenger in a vehicle.

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Claim 3 (cancelled)

Claim 4 (currently-amended): The method according to claim [[3]] 1, which comprises, if the object moves out of the predetermined region:

a2) calculating the current differential image;

b2) extracting the current contour from the current differential image;

c2) calculating the position of the object using a cross-correlation of the current contour with the template;

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d2) if a magnitude of the correlation exceeds a predefined amount, centering a measuring window on the current contour, replacing the template with the current contour, and going to step e2); in an absence of a differential image, jumping to step a2); otherwise jumping to step a1);

e2) if the contour is again within the predetermined region: jumping to step a1);

f2) if the contour moves in a predetermined warning region, issuing an alarm signal; and

h2) jumping to step a2).

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Claim 5 (currently-amended): A device for determining the position of a moveable object within a given area, comprising:

a video camera with a defined frame sequence time;

a control unit with a computer unit; and

a frame storage device ~~storing evaluation software~~; and

said evaluation software configured to perform the method according to claim 1.

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Claim 6 (original): The device according to claim 5, wherein said frame storage device has a capacity for storing at least five frames.

Claim 7 (original): The device according to claim 5, wherein said video camera is a camera selected from the group consisting of a CCD camera and a CMOS camera.

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Claim 8 (original): The device for determining the position of a moveable object according to claim 5, wherein:

the object is a head of a passenger in a front seat of a vehicle having a dashboard;

said video camera has an optical axis and is configured such that the optical axis is aligned approximately perpendicularly with respect to a plane in which movements of the passenger normally take place between the front seat and the dashboard; and

said camera has optics that register at least approximately in a region between the passenger and the dashboard.

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Claim 9 (original): The device according to claim 8,
comprising:

an airbag control device activated dependent on a prediction
of when the head of the passenger will penetrate into a hazard
range;

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said prediction based on a trajectory of the head and a speed
of the head.

Claim 10 (original): The device according to claim 5,
comprising an infrared light source, said video camera
provided with a filter that cuts out wavelengths below a near
infrared spectrum range.

Claim 11 (original): The device according to claim 5, wherein
said control device receives an emergency braking signal when
an emergency braking occurs.